Northwest Mountain Region Safety Summit

Office of Airports Efforts to Reduce Runway Incursions

July 23, 2008

Paul Johnson

Airport Actions to Reduce Incursions

- **Signs and Markings**
- **Enhanced Signs and Markings**
- **Participate in RSAT / RIAT**
- **Review Safety During Construction Plans**
- **Recurrent Training for Ground Vehicle Ops**
- **Funding Airport SMS Pilot Progams**

Airport Actions to Reduce Incursions

- **Engineering Brief #75 (TW and Apron Design)**
- **Rewrite of AC 150/5300-13 (Airport Design)**
- **Fund Projects that Reduce Runway Incursion**
- **Annual Part 139 Inspections**
- **Investigate Vehicle/Pedestrian Deviation (VPD)**
- **Track Performance Metrics**

Airport Recurrent Driver Training

- **AC 150/5210-20 Ground Vehicle Operations on Airports effective March 31, 2008**
  - Strongly recommends regular recurrent driver training for **all** persons with access to movement areas.
  - FAA now undertaking a rule making process to make this training mandatory.

Taxiway Layout Guidance

- **Airport layout and taxiway arrangement can be a significant factor in preventing runway incursions**

- **Engineering Brief #75-** ***Incorporation of Runway Incursion Prevention into Taxiway and Apron Design*****, 11/19/07**

Engineering Brief #75 Key Points

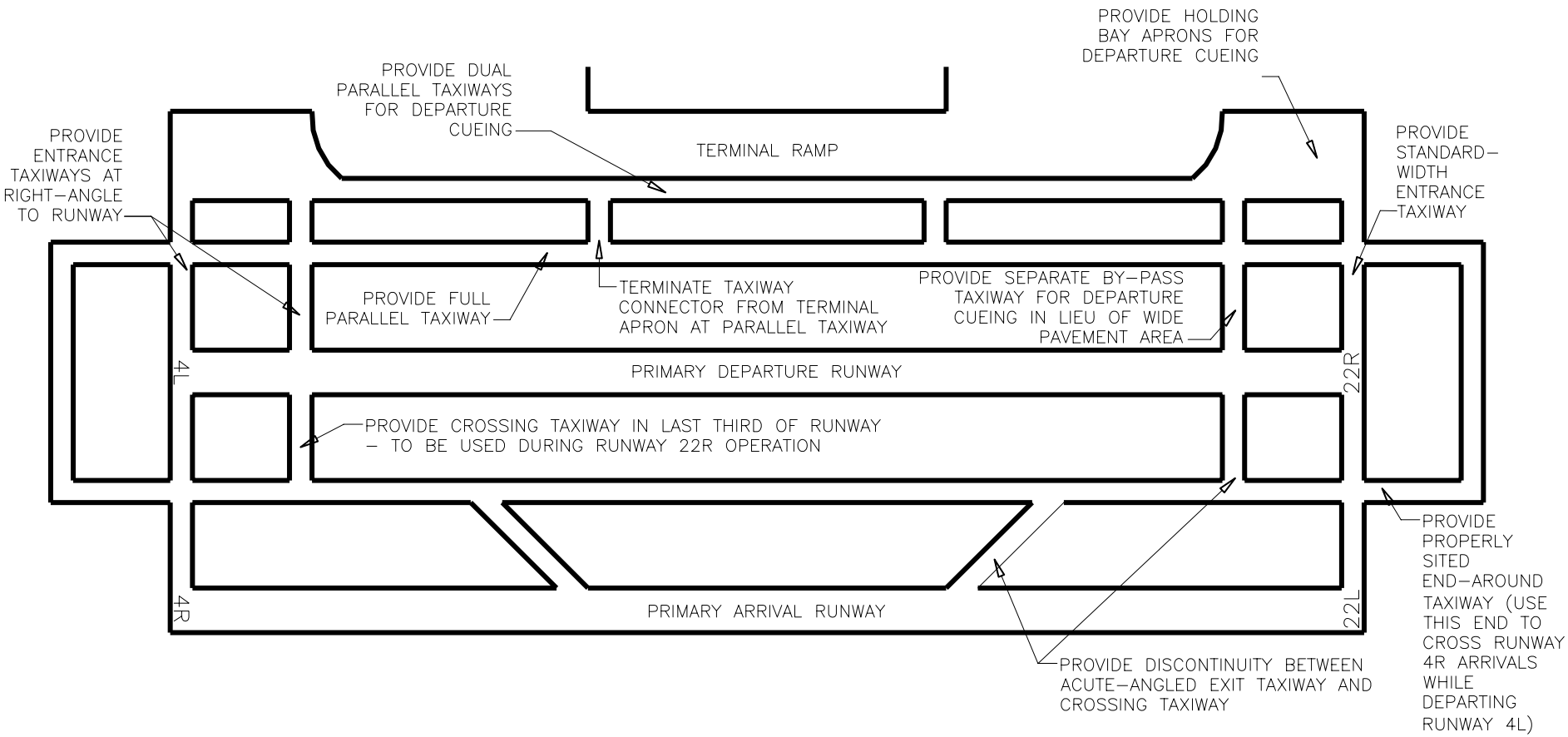
- **Limit aircraft crossing active runways**
- **Crossing taxiway within the last “third” of the runway**
- **Maintain standard signage, marking, and lighting configurations**
- **Use right-angle taxiway/ runway intersections (except high speed exits)**
- **Avoid wide expanses of pavement at runway entry**
- **Filet Design**

Engineering Brief #75 Key Points

- **Limit the number of taxiways intersecting at one point**
- **Avoid direct access from terminal ramps to runway**
- **High speed exit taxiways should not lead directly to a runway crossing**
- **Avoid “Y” taxiway configurations and multiple pavements converging together**
- **Rewrite of AC 150/5300-13 (Airport Design) will incorporate these changes.**

Engineering Brief #75 – Airfield Concept

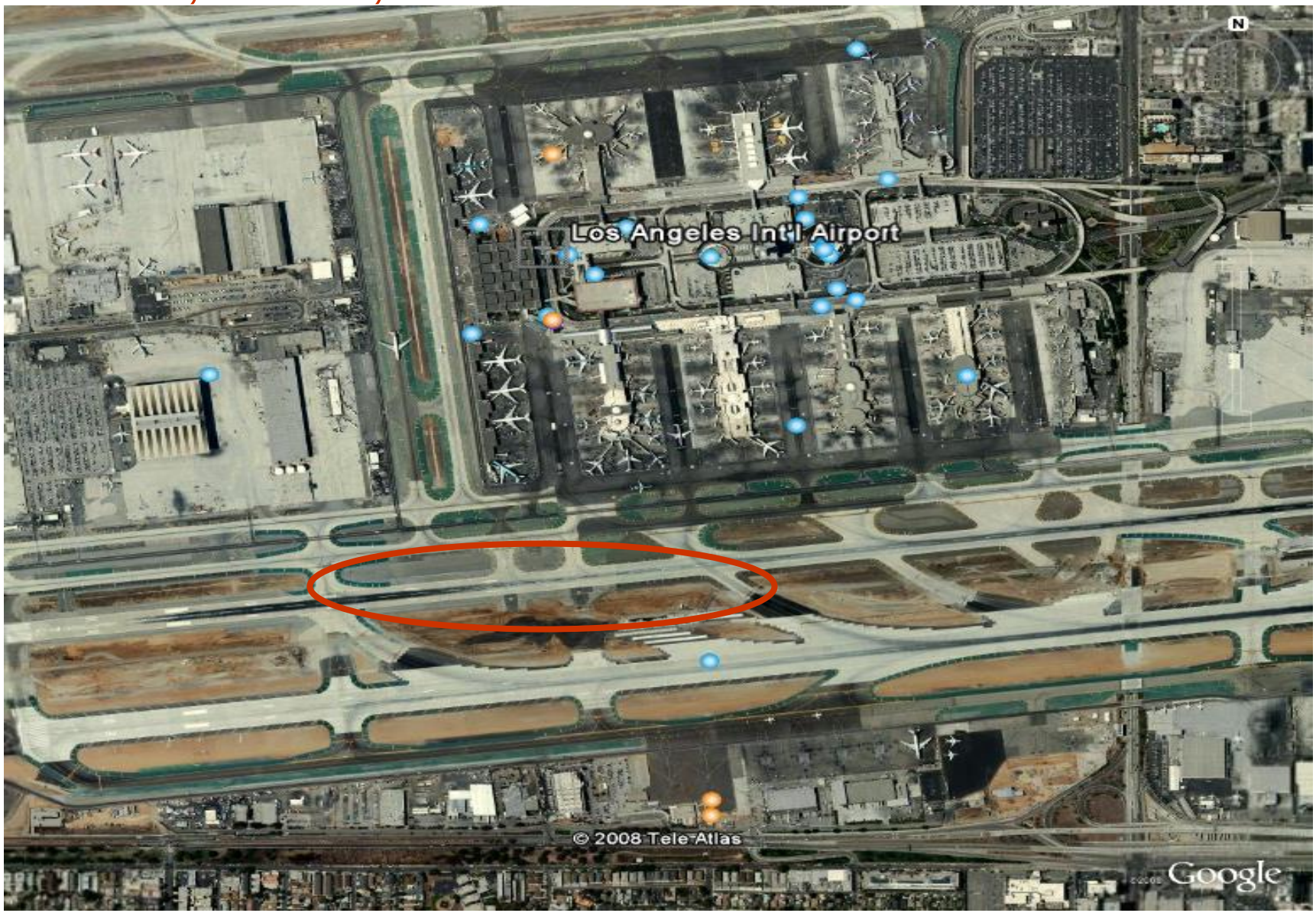
FIGURE 6, "OVERALL AIRFIELD LAYOUT CONCEPT"



Problematic Taxiway Connector Examples

Relative to Recorded Runway Incursions 1997 – 2000

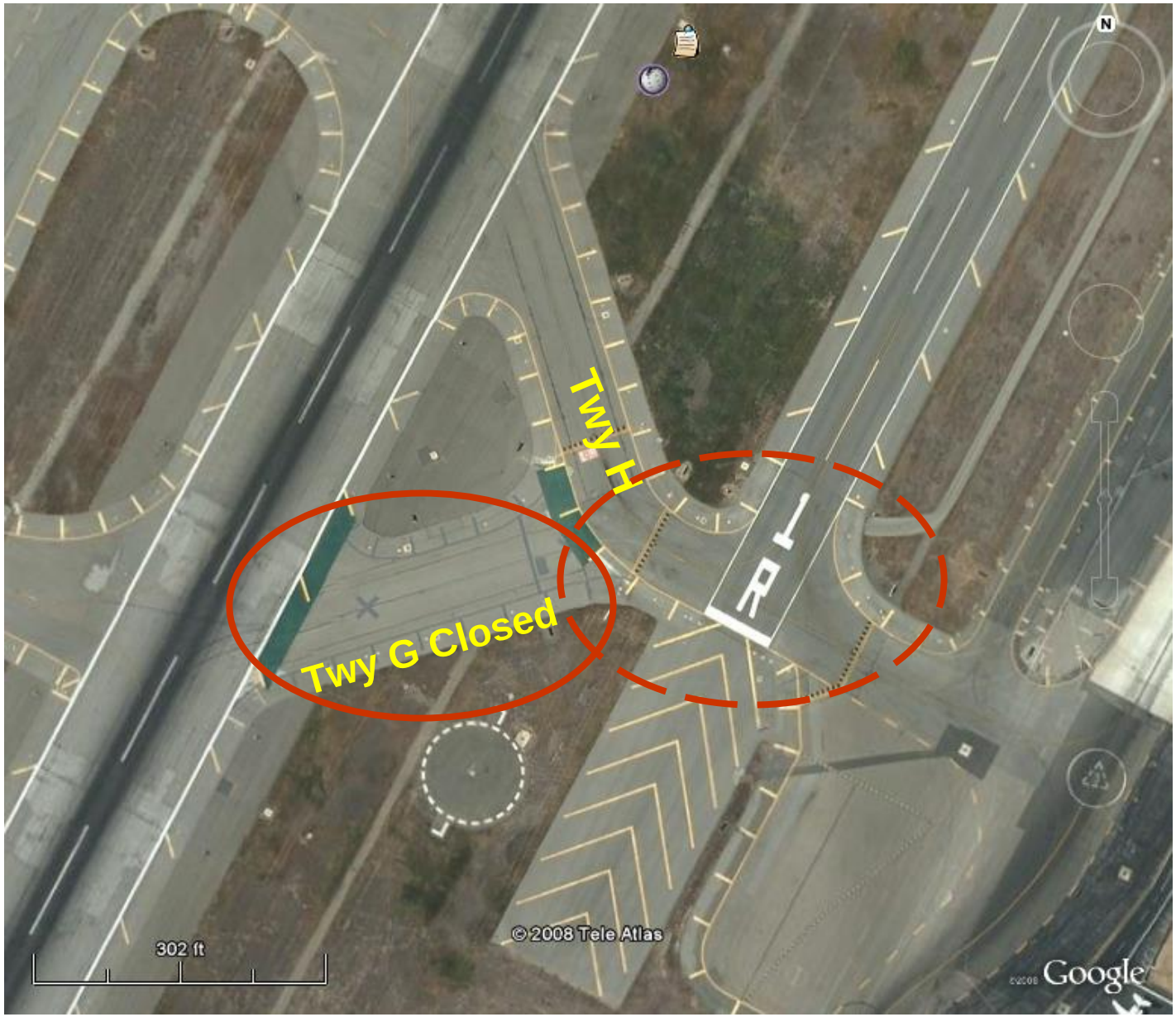
LAX – Rwy 7L/25R and Twy Exits
14-PDs, 1-V/PD, 3-OEs



“Y-Shape” Taxiway Connectors

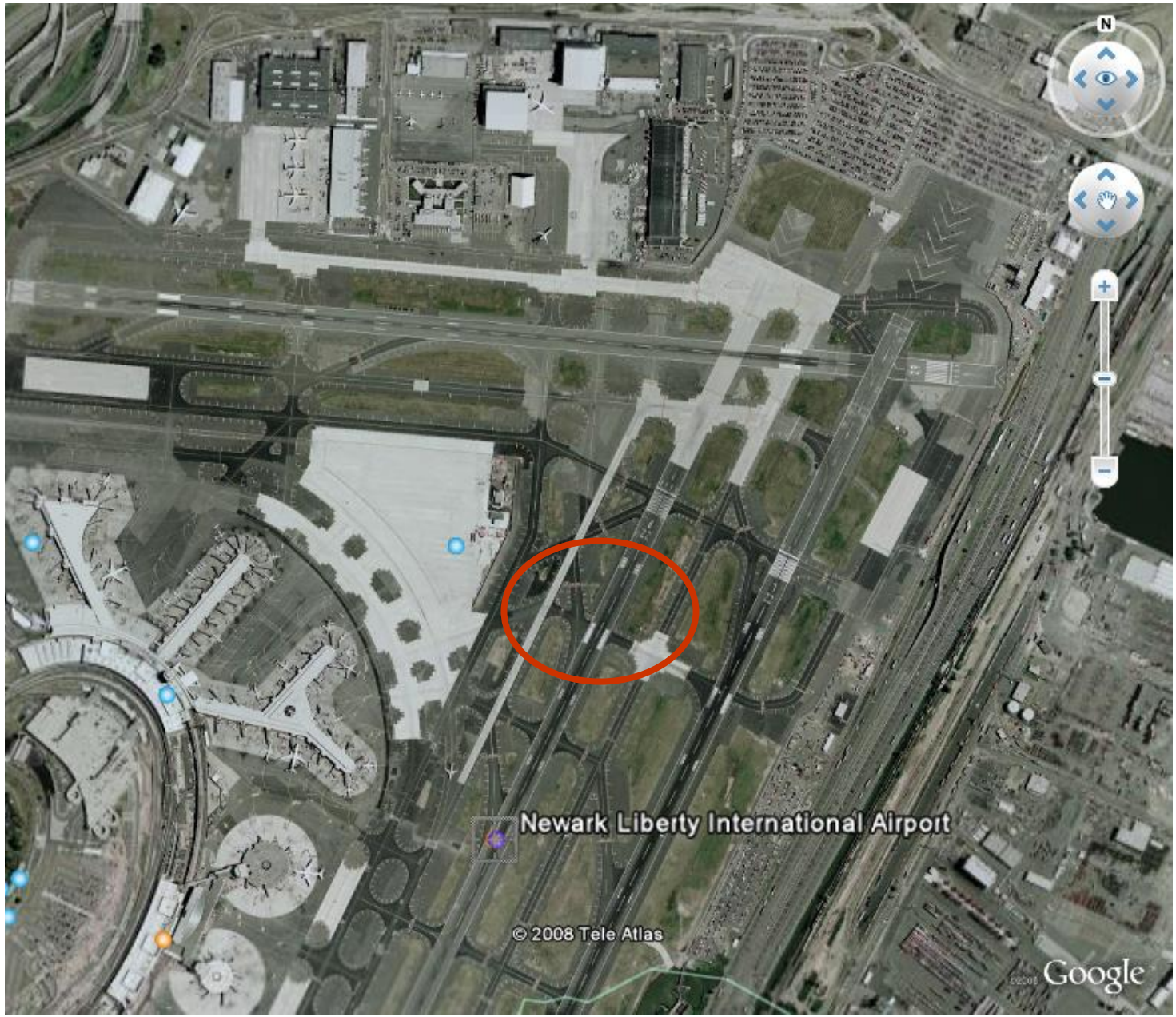
SNA – Santa Ana/John Wayne Arpt

SNA: **Total 15 incursions**



Crisscrossing High-Speed and Average Speed Exit/Entrance Taxiways

ERW


N
Newark Liberty International Airport
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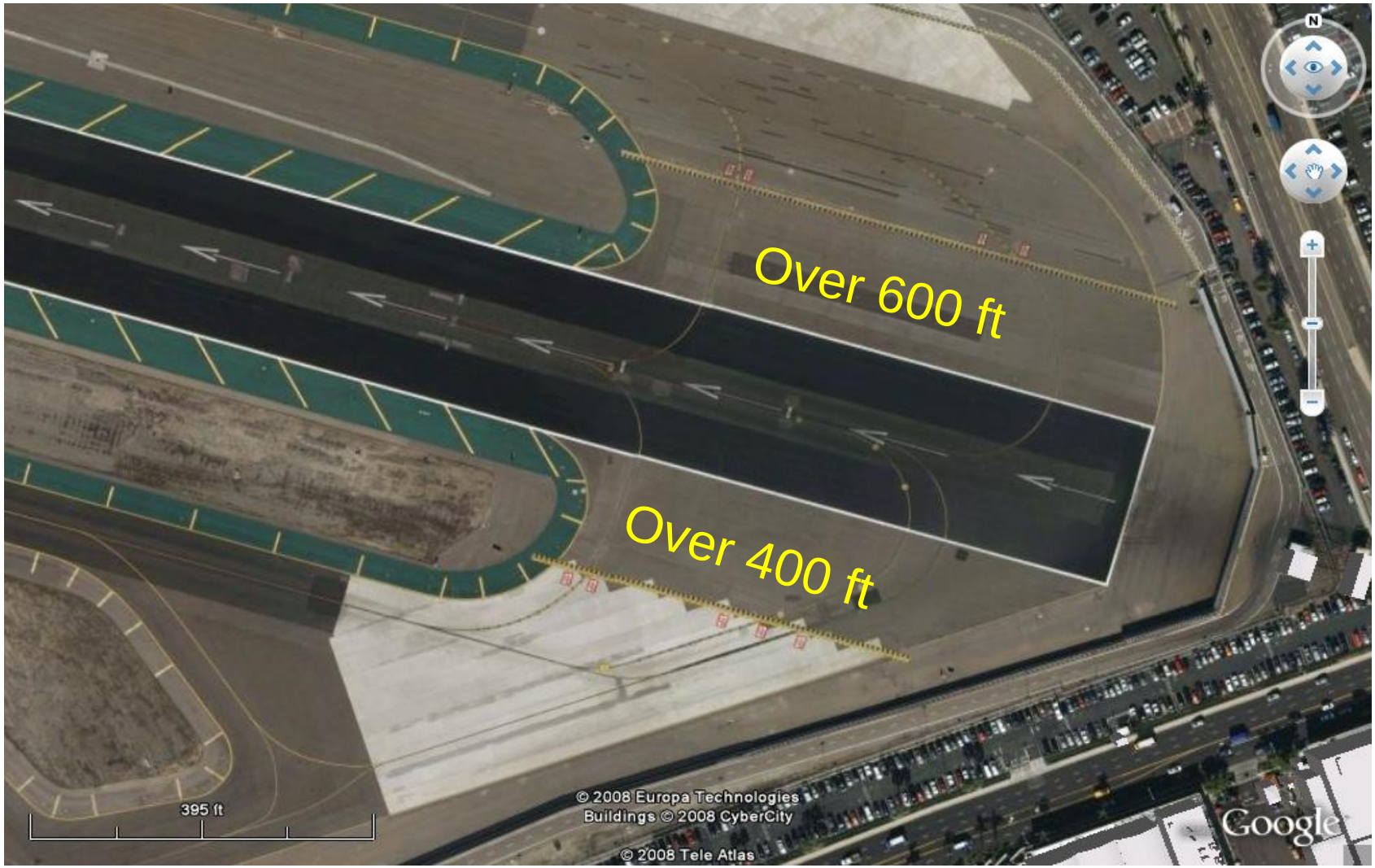
Extra Wide Taxiway Connectors along Aprons at Runway Ends

SAN: 2-PDS, 1-OE


Over 600 ft
Over 400 ft
395 ft
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Buildings © 2008 CyberCity
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Intersection under construction


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AC 150/5300-1J Change 1 (Standards for Airport Marking)

- **Enhanced TW Centerline Markings**
- **Extended RW Holding Position Markings**
- **Surface Painted Hold Signs**

Enhanced Centerline and Painted Hold Signs Eligible for AIP

Enhanced markings are eligible for AIP funding, however, Airport operators with their own painting equipment have the option to install the enhanced taxiway centerline markings in-house.

Enhanced Taxiway Centerline Marking

The enhanced taxiway centerline marking begins 150 prior to all holding position markings and consists of a yellow dashed line on either side of the taxiway centerline. The dashes are 9 feet long with 3 foot gaps.

Airport operators installing these markings should also review SAMS 21/SAMS 23 before installing the markings. SAMS 21 and SAMS 23 provide additional information for installing enhanced taxiway edge markings.

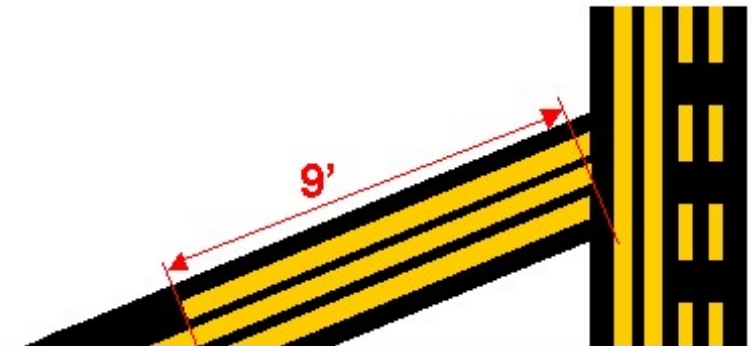
SIGNS AND MARKING SUPPLEMENT #23
JANUARY 10, 2006

117. How should the enhanced taxiway centerline dashes be applied to a taxiway centerline that intersects the holding position marking at other than a 90 degree angle?

Answer: When a taxiway centerline intersects the holding position marking at an angle other than 90 degrees, the enhancement dashes on either side of the centerline would start and stop at different locations if both dashes were nine feet in length. In this situation it is more important that the dashes end at the same location relative to the centerline than the fact that each dash is exactly nine feet in length. The following procedure should be followed for laying out the dashes in this situation:

Each dash in the first set of dashes will always start the same distance from the first solid bar of the holding position marking as the taxiway centerline (i.e. 6 to 12 inches). To locate the end point of the first set of dashes, measure 9 feet along the taxiway centerline. An imaginary line perpendicular to the taxiway centerline at this point will mark the end of the first dash enhancement on each side of the centerline. (Note: One dash will be longer than nine feet while the other will be shorter than nine feet.) See Figure 117.

If the centerline is straight, measure three feet from the imaginary line above (or from the end of the first set of dashes) to identify the beginning of the next set of dashes. The second set of dashes and all subsequent dashes will be nine feet in length with spacing of three feet between each set of dashes. If the centerline is curved, see **SAMS 118** for the proper application.



Changes to Marking Standards in AC 150/5340-1J

The extended holding position marking extends onto the paved shoulders at holding positions used by Group 5 and 6 aircraft. Other holding positions not used by Group 5/6 aircraft are not required to have the extended holding position marking.

Changes to Marking Standards in AC 150/5340-1J

The extended holding position marking extends onto the paved shoulders to within 5 feet of the pavement edge or 25 feet from the edge of the taxiway, whichever is less. If a light fixture is aligned with the marking, the extended holding position marking ends to 5 feet from the light fixture.

Changes to Marking Standards in AC 150/5340-1J

However, it is not a problem if the extended holding position marking is painted past a light fixture.

Changes to Marking Standards in AC 150/5340-1J

The taxiway edge marking should not be interrupted for the holding position marking with a 3 foot gap on the runway side. The taxiway edge marking should abut the holding position marking, or black outline if present, according to Par 23 (b)(2)(ii) and (iii) of AC 150/5340-1J.

Changes to Marking Standards in AC 150/5340-1J

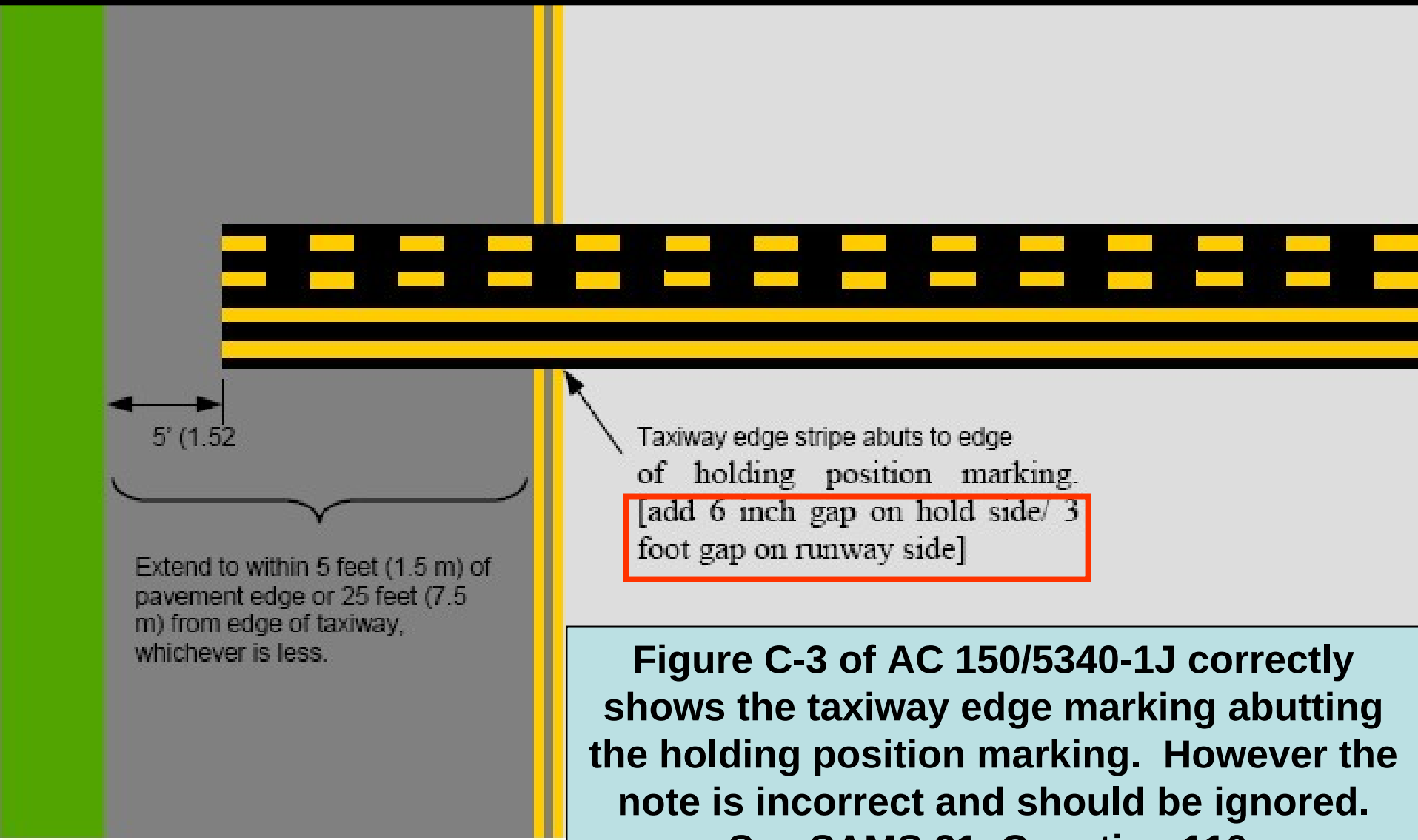


Figure C-3 of AC 150/5340-1J correctly shows the taxiway edge marking abutting the holding position marking. However the note is incorrect and should be ignored. See SAMS 21, Question 110.

Figure C-3. Enhanced Runway Holding Position Markings on Taxiways

Surface Painted Holding Position Signs

Change 1 to 150/5340-1J now requires surface painted holding position signs at all Part 139 airports with more than one runway by March 31, 2010.

Surface Painted Holding Position Signs

Surface painted holding position signs will be required at all entrances to runways from taxiways.

The new marking requirements in Change 1 to AC 150/5340-1J are based on NTSB Recommendation A-07-46, issued after the Comair accident in Lexington, KY.

AC 150/5340-1J, Chg 1, Par 26b states, *"The surface painted holding position signs are located both to the left and to the right of the taxiway centerline."* However, the second surface painted holding position sign was not intended to be mandatory. SAMS 22, Question 112 states, *"The use of the second surface painted holding position sign is highly recommended (but not required), especially when (a) aircraft that require a two person crew operate on a regular basis or (b) the holding position marking is located on the parallel taxiway rather than on the stub taxiway."*

Marking Requirement Dates

- **Extension of Runway Hold Lines** **June 30, 2008**
- **Surface Painted Hold Position Signs** **March 31, 2010**
- **Enhanced Taxiway Centerline Marking**
  - Airports over 1.5 million passenger enplanements — June 30, 2008
  - Airports over 370,000 but less than 1.5 million — March 31, 2009
  - Remaining Part 139 airports — March 30, 2010

Airport Certification Program

- **Annual Inspections**
- **Investigate Vehicle/Pedestrian Deviation (VPD)**
- **Track Performance Metrics**
  - Enhanced Centerlines 370K-1.5M
  - Enhanced Centerlines <370K
  - Recurrent Training for Non-Airport Employees
  - VPD’s
  - 139 Inspections
  - Open and Past Due Discrepancies

Color Codes	Category A, B, or C	Category D

Total for FY08 = **14**

Total Cat A, B or C = **6**

	Date	LOW	What Happened	Loss of Separation	Closest Proximity	Category A, B or C	Category D	Investigation Status	Notes
14	11-Jun-08	HLN	Hertz employee drove onto txwy and rwy w/o permission	N	N/A				
13	11-Apr-08	DEN	Airport OPS8 crossed RWY 35L Hold Lines W/O clearance	N	N/A		D	Closed	Sent LOI, Response has been received
12	1-Apr-08	CPR	Airport 49 entered RWY 21 w/o permission	N	N/A		D	Closed	Conducted Inspect 06/23/08
11	15-Feb-08	TTD	Pedestrian walked upto but not on RWY	N	N/A	C		Closed	
10	15-Jan-08	PAE	Tug crossed RWY w/o clearance.	N	N/A		D	Closed	
9	28-Dec-07	DEN	Snow plow backed over the hold bar during snow removal ops.	N	N/A	C		Closed	Sent LOC
6	27-Nov-07	PDX	2 FD trucks entered RWY w/o clearance. Aircraft over t-hold, given go-around	N	N/A	C		Closed	

Cat A: Separation decreases, participants take extreme action to narrowly avoid a collision
Cat B: Separation decreases, and there is a significant potential for a collision
Cat C: Separation decreases, but there is ample time and distance to avoid a collision
Cat D: There is little or no chance of collision, but the definition of a runway incursion is met

Any Questions?